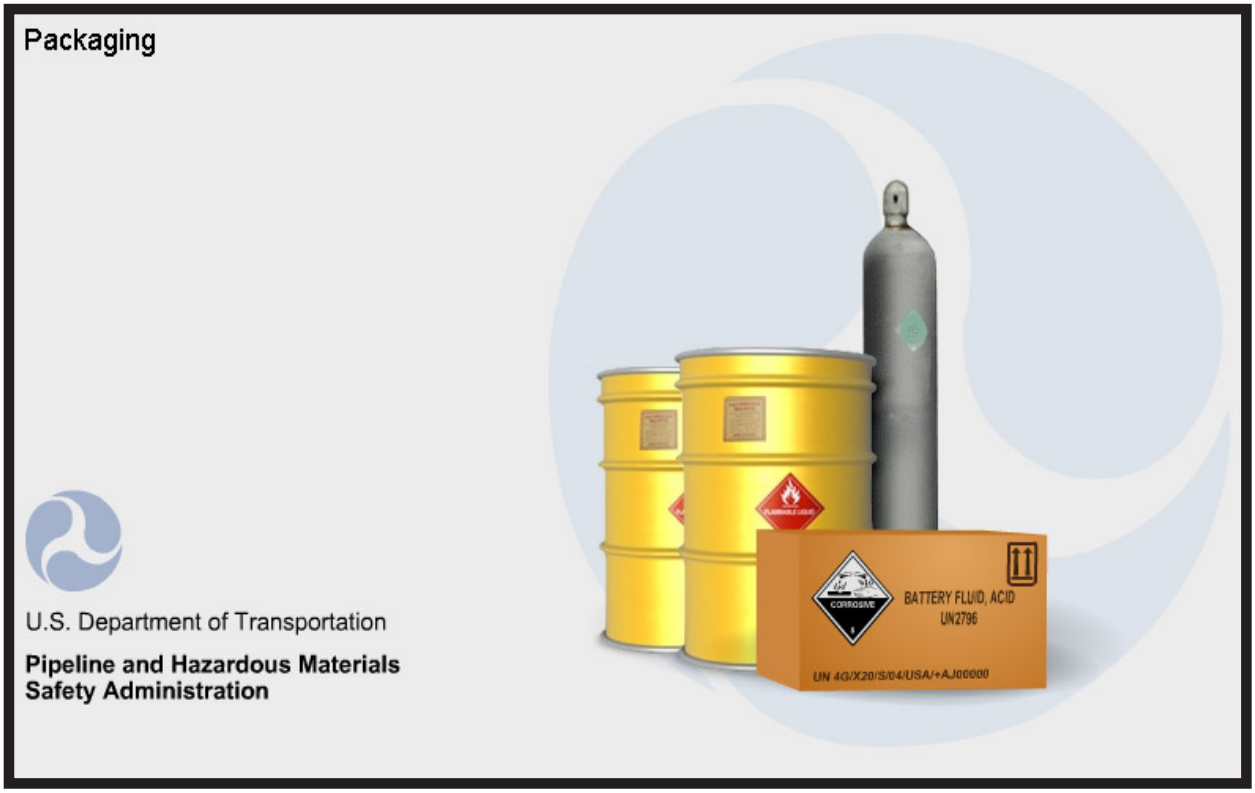
Hazardous Materials Transportation Training Modules

VERSION 5.1

STUDENT



MODULE 5

Script

Visual

Narrative

1

Hazardous materials shipping is a highly regulated business, for good reason. Regulation protects the handlers of these hazardous materials and the environment in which we live. Shipping hazardous materials in anything less than fully certified packaging not only risks damage to the environment, but also could be costly to your business. If you are ready, let's take a look at the DOT requirements for the packaging of hazardous materials using the Hazardous Materials Table (HMT) and Part 173 of the Hazardous Materials Regulation.

2

After completing Module 5 on Packaging, you should be able to:

- Define "packaging" according to the HMR;
- Identify the shipper's responsibility as it relates to hazardous materials packages and packaging, and any exceptions to these requirements
- Identify special types of packaging required for a variety of hazardous materials, including general and specific requirements and any exceptions
- Identify requirements and exceptions related to Limited Quantities, Agriculture Products, Materials of Trade, and Lab Packs
- Identify required methods for handling damaged or leaking HM packages
- Identify DOD packaging certification requirements
- Identify requirements for overpacks

3

Who is required to comply with the HMR?
According to 171.2 of the HMR, anyone who offers or accepts a hazardous material shipment must comply with the HMR. Providers of packagings used in the transportation of hazardous materials must comply as well. No person, individual or company may offer or accept a hazardous material for transportation in commerce unless the shipment complies with the HMR.

4

If you transport hazardous materials in commerce within the jurisdiction of the United States, you are regulated and must comply with the HMR. The main function of HMR packaging requirements is to assure that hazardous materials stay in the package during transportation.

5

The packaging of hazardous materials has its own vocabulary. Common terms take on new meanings when applied to the HMR. Refer to the glossary in the "How to Use the HMR" booklet located under the Resources button, and the HMR definitions in Sections 171.8, 178.2, 178.601, 178.700, 178.801, and 180.350 for definitions related to the packaging of hazardous materials for transportation.

6

The term ‘package’ refers to the packaging plus its contents, and is used throughout the HMR.

7

The term ‘packaging’ refers to a receptacle and any other components or materials necessary to perform its containment function in conformance with the minimum packing requirements of the HMR. A package must meet minimum packaging requirements. Packagings include fiberboard boxes, drums, jerricans, portable tanks, cargo tanks, tank cars, multi-unit tank car tanks, cylinders, and containers other than freight containers and overpacks. The term packaging is also used extensively throughout the HMR. To use the HMR correctly, you must know the difference between a package – a packaging plus its contents – and a packaging, which does not include the hazard materials being shipped.

8

You may not offer a hazardous material shipment in any mode, unless it is prepared in accordance with the HMR.

9

If you offer hazardous materials for transportation, you must ensure the training of your hazmat employees. Training must be in accordance with the applicable parts of the HMR.
Every person who performs a function subject to the HMR must be trained and tested, and the hazardous materials employer must create and maintain records of training in accordance with Section 172.704(d). Every person such as a freight forwarder, agent or broker, who performs a function required by Part 173 must perform that function according to the HMR. This means that all hazardous materials must be properly classified, described, and packaged. All hazmat employees must receive security awareness training. In-depth security training, however, is only required for those hazmat employees whose employers must develop a security plan.

10

For example:
If you are a carrier who repackages a hazardous material for any reason, you are preparing the shipment for transportation. You must repackage the material in accordance with all applicable HMR provisions. It makes no difference that you are not the original shipper; you are functioning as a shipper. More than one person can perform an “offeror” or shipper function for the same shipment. Each person performing an “offeror” function is accountable for HMR packaging responsibilities.

11

Professor Fed's Knowledge Check 1

Instructions: Click and drag each of the terms shown here to fill in the blanks below. Click on the DONE button when you are finished.

freight forwarder	cosignee	carrier
offers	requests	packaging
truck	storage	package

1. The shipper and the _____ share responsibility to offer and/or accept only hazardous materials that comply with the HMR.

2. Under the HMR a _____ consists of completed _____ plus its contents (i.e., the hazardous material).

3. Anyone who _____ hazardous materials for transportation must ensure the training of his/her hazmat employees in the applicable requirements of the HMR.

4. Any person performing a _____ function must comply with applicable HMR packing requirements.

12

You must package hazardous materials for transportation in any mode as specified in the HMR. The initial carrier and the U.S. Department of Transportation and its designated agencies are authorized to inspect hazardous materials packages for HMR compliance. They may inspect for methods of manufacture, packing, closure and storage of hazardous materials that affect safety in transportation.

13

Professor Fed's Knowledge Check 2

Instructions: Select the best answer from the four choices provided.

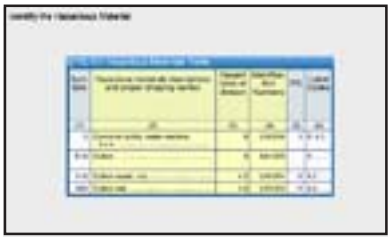
The packaging of hazardous materials for all modes of transportation must be as specified in the HMR. Packages of hazardous materials may be inspected for safety by _____ and the initial carrier.

A. FBI
B. USDOT
C. local fire marshal
D. anyone

14

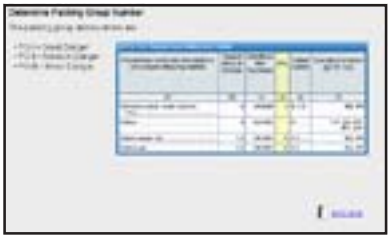
The HMR prescribes packaging authorizations for the transport of hazardous materials. In the HMT, Columns (8A), (8B), and (8C) direct you to specific packaging requirements for each hazardous material. The correct packaging is determined by the hazard class/division of the material, the packing group and the quantity of materials being shipped. For this module, we are assuming that the material has been properly classified and assigned a proper shipping name. Click on each button to learn more.

15



To select the proper packaging, you must first turn to the Hazardous Materials Table, which is located in Section 172.101 of the HMR. Next, you will need to identify the material's proper shipping name, hazard class, and identification number in columns 2, 3, and 4.

16



The next step is to determine the packing group using Column 5. The packing group is indicated by the roman numerals I, II, or III. These reflect the degree of danger within certain hazard classes. Packing Group I represents the greatest danger, Packing Group II represents a medium danger, and Packing Group III represents a lesser danger.

17

Now follow across the HMT to Column 8 "Packaging (Section 173.***)." Column (8A) provides exceptions to the packaging requirements if certain conditions are met. Column (8B) provides authorized packaging for non-bulk, and Column (8C) provides authorized packaging for bulk. To find the reference section, replace the asterisks after 173 in the heading with the references found in Columns (8A), (8B), and (8C). For instance, an entry of 242 in column (8C) refers you to Section 173.242. Remember that Column (8A) lists exceptions, not special permits.

18

Professor Fed's Knowledge Check 3

Instructions: Select the best answer from the four choices provided.

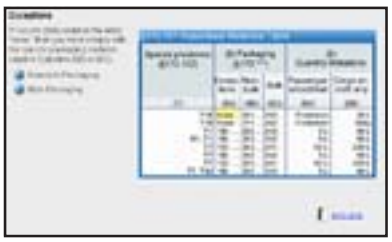
What is the proper packaging authorization for a shipment consisting of 2.0 L of kerosene in a metal can and packaged in a strong outer container? Kerosene is a Class 3, PG III material.

A. 173.150
B. 173.202
C. 173.242
D. None of above

19

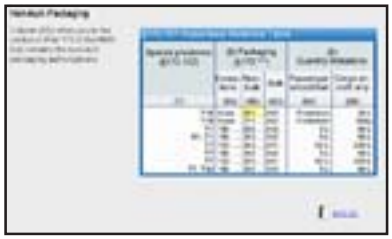
When you ship hazardous material as a Limited Quantity, it is excepted from specification packaging and placarding in all modes of transportation. Also, except for Division 6.1 materials or materials transported by aircraft, a limited quantity is excepted from labeling. Section 171.8 defines "Limited Quantity" as the maximum amount of a hazardous material for which there is a specific labeling or packaging exception.

20



If Column (8A) contains the entry "none," then you must comply with the specific packaging sections, listed in Columns (8B) or (8C). Also, you must comply with a specific packaging section when the package does not meet the requirements of the section referenced in Column (8A). Click on the buttons to learn more.

21



Column (8B) refers you to the section in Part 173 of the HMR that contains the non-bulk packaging authorizations. A shipper may choose any appropriate packaging listed in the authorization section shown in Column (8B).

22

In the packaging section, it is important to read the heading of each paragraph as well as the entire packaging section. Also read any other sections mentioned within the section. Some paragraphs might specify packaging for other than the material you are shipping. Other sections provide exceptions from specific packaging authorizations; that is, in addition to the exceptions listed in Column (8A).

23

It is important to become acquainted with the different types of packagings in each of the packaging sections. Non-bulk packaging for liquids is found in Sections 173.201, 173.202, and 173.203. As with all packagings in subparts E and F, these provisions do not apply to Class 1 and Class 7 materials. If a shipper wanted to package gasoline in 55-gallon metal drums, Section 173.202 offers a choice of drums made from steel, aluminum or other metals. Review Section 173.202 to see specifically what it says about packaging requirements for gasoline in 55-gallon metal drums.

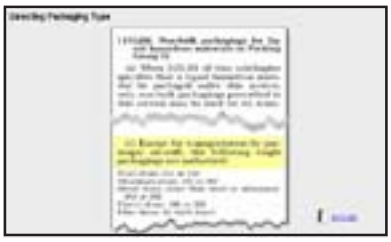
24

Notice that Section 173.202(a) specifies that non-bulk packagings used for a shipment of gasoline must meet three sets of requirements: the general packaging requirements of subpart B of Part 173, the requirements for PG I or PG II materials in Part 178, and the particular requirements of special provisions in Column 7 of the HMT.

25

Let's say you want to ship 8,000 gallons of gasoline in a cargo tank. Column (8C), the bulk packaging column, contains the reference 242 for the entry "gasoline". This means that Section 173.242 offers a selection of bulk packagings that you could use for this shipment. Section 173.242 provides a list of rail cars, portable tanks, cargo tanks, and intermediate bulk containers that may be used, and the conditions for their use.

26



In selecting a packaging, you must also consider quantity and modal limitations that may restrict your choices.

For example, in Section 173.202(c), single packagings are not authorized for the transportation of gasoline by passenger aircraft.

27

Professor Fed's Knowledge Check 4

Instructions: Select the correct answer from the choices provided.

Which column of the HMT refers you to the section in Part 173 of the HMR that contains the non-bulk packaging authorizations?

A. (8A)
B. (8B)
C. (8C)
D. (8D)

28

Professor Fed's Knowledge Check 5

Instructions: Click and drag each of the terms shown here to fill in the blanks below. Click on the DONE button when you are finished.

needs specific previous next packaging

1. If HMT Column (8A) says "None" or the exception criteria are not met, compliance with the _____ packaging section, referenced in either Column (8B) or Column (8C) of the HMT, is required.

2. Quantity and modal limitations may restrict _____ selection.

29

Performance testing requirements for all packaging designs are contained in Part 178. Packagings tested to meet the Part 178 performance requirements are called “UN Standard Packagings.” Section 171.8 defines “UN standard packaging” as a packaging conforming to standards in the UN Recommendations on the Transport of Dangerous Goods. Click on the buttons to learn more.

30

Every UN standard packaging must be marked with the appropriate United Nations certification mark, which contains the ID code letters and number(s), preceded by the UN symbol. In addition, the specification packaging must be marked with a letter to indicate the packing group performance level.

For example: X performs to the level of PG I, and may also be used for PG II, and III; Y performs to the level of PG II, and may also be used for PG III; and Z performs to the level of PG III, and may not be used for any other packing group. The specification packaging must also be marked with a number designating the specific gravity for liquids or maximum gross mass (in kilograms) for solids of the tested packaging design.

The example shown here is a packaging for solids, the mark “4G/Y29” indicates a UN specification 4G-fiberboard box tested to Packing Group II performance requirements with a maximum gross mass of 29 kilograms.

UN standard packagings, such as intermediate bulk containers (IBCs,) can be built and tested to a variety of performance levels and capacities. It is very important that the UN standard you select is authorized for the packing group of the material you want to ship. The package must be tested for the specific gravity or mass for the hazardous material being shipped.

31

All UN non-bulk packagings are required to be marked in a method similar to that shown here in the graphic. The markings must include the following:

- The hydrostatic test pressure for single and composite packagings intended for liquids, or the letter "S" for packagings intended for solids or inner packagings
- The last two digits of the year of manufacture; the state or country authorizing allocation of the mark
- The name and address or registered symbol of the manufacturer or approval agency certifying compliance with Part 178

32

Professor Fed's Knowledge Check 6

Instruction: Select the best answer from the four choices provided.

Unless stated otherwise, packaging for hazardous materials must meet the _____ tests in Part 178 and must be marked with the United Nations certification mark or marked in accordance with DOT special packaging requirements.

A. labeling
B. random
C. performance
D. excepted

33

Professor Fed's Knowledge Check 7

Instruction: Select the best answer from the four choices provided.

Given the hazardous material Corrosive liquids, toxic, n.o.s. PGII, which combination packaging listed below is NOT authorized as an outer packaging?

A. Steel drum: 1A1 or 1A2
B. Plastic drum: 1H1 or 1H2
C. Plastic jerrican: 3H1 or 3H2
D. Bag, textile: 5L1, 5L2 or 5L3

34

Professor Fed's Knowledge Check 8

This learning exercise will evaluate your skill and ability to select references for special provisions, packaging exceptions and packaging authorizations for non-bulk and bulk packaging using the HMR. Using the HMR, select the correct references for the hazardous materials listed on the chart. Complete the chart by dragging the correct references to their proper location on the chart. Each reference may be used only once. You will have two chances to correctly answer this exercise.

IP2	**TP1**	**202**	**153**	**241**
243	**TP2**	**152**	**242**	**154**
201	**IP4**	**211**	**240**	

Hazardous Materials	Special Provisions	Packaging		
		Exceptions	Non-Bulk	Bulk
Glycidaldehyde UN2622	IB2, T7 _____	150	_____	_____
Copper chlorate UN2721	A1, IP8 IP2, _____	_____	212	_____

35

Professor Fed's Knowledge Check 9

Instruction: Select the best answer from the four choices provided.

The hazardous material Phosphoric acid, solid, UN1805, PGIII is subject to the special provision IP3. The special provision IP3 indicates which limitation?

A. Applies only to transport by aircraft.
B. Applies only to transport by highway.
C. Applies only to special IBC packing provisions.
D. Applies only to non-bulk packaging requirements.

36

The HMR prescribes general packaging requirements for all hazardous materials, while certain hazardous materials must meet additional specific packaging requirements. Click on the buttons to learn more.

37

Many liquid hazardous materials expand when heated. For this reason, all containers of liquid hazardous materials must have vacant space or outage. This space is also referred to as ullage or vapor space. In other words the packaging must not be entirely full.

38

In addition to the requirements for outage, also called vapor space, containers of liquid hazardous materials must be tightly and securely closed. A combination package containing liquid hazardous materials must be packed so that closure on the inner packages remains upright. They must be packed and cushioned to prevent breakage or leakage. Packagings used for solids that may become liquid during transportation must be capable of containing the material in a liquid state.

39

In summary, general packaging requirements are found in Section173.24 and include packaging design criteria and filling limits based on the physical nature of the material to be packaged. Additional general packaging requirements are located in Section 173.24a for non-bulk; Section 173.24b for bulk; and Section 173.27 for air transportation.

40

Professor Fed's Knowledge Check 10

Determine whether or not the given packaging is authorized for the described material. Select "Yes" if the packaging is authorized; "No" if it is not. Cite the HMR reference(s) you used to determine your answer by clicking and dragging the correct answer(s) to the blank line to correctly identify the HMR reference.

Six polyethylene (plastic) receptacles of one gallon each containing 100% Formic acid, 8, UN1779, PG II, inside a UN4G specification fiberboard box weighing 50 pounds:

No	**173.202(b)**	**173.150(b)**
Yes	**173.212(b)**	**173.203**

Authorized	Packaging Section(s)
_____	_____

41

Column 9 lists the quantity limitations for hazardous materials transported by passenger railcars and passenger aircraft, as well as for shipments by cargo aircraft. When Column (9A) of the HMT indicates a material is “Forbidden”, it may not be offered for transportation aboard passenger aircraft or passenger railcars. The word “Forbidden” in Column (9B) indicates it may not be offered for transportation on a cargo aircraft. The first entry on this example has the word “Forbidden” in Column (9A), which means it cannot be transported by passenger aircraft or passenger railcar. The second entry in this example has the word “Forbidden” in both Column (9A) and (9B), indicating it may not be transported by either passenger or cargo aircraft or passenger railcars.

42

Hazardous material packaging for air shipment must be designed and constructed to prevent leakage caused by altitude and temperature changes. Additionally, air shipments of hazardous materials must meet not only the general packaging requirements for transportation by aircraft, but also the UN standard or DOT specifications packaging requirements as appropriate.

43

Packaging closures must be held securely in place by positive means to prevent leakage. Combination packaging containing certain hazardous liquids must contain sufficient non-reactive absorbent materials to absorb any leakage. Where absorbent material is required and the outer package is not leak-tight, you must use a leak proof liner, plastic bag or other means of containment.

44

All cylinders transported by air must have protection to prevent operation of or damage to valves. Equip cylinders with securely attached valve caps, protective headrings or place cylinders in a box or crate. Vented closures are used to reduce internal pressure and prevent the unintentional release of the product. Aircraft may not transport cargo tanks, tank cars or packages with vented closures.

45

Professor Fed's Knowledge Check 11

Instructions: Click and drag each of the terms shown here to fill in the blanks below. Click on the Done button when you are finished.

special provisions	special permits	cargo	passengers
seepage	damping	absorbent	head covers
leakage	valve caps		

1. In addition to the packaging authorizations in Columns (8A), (8B), and (8C), the hazardous materials may be subject to _____ in Column (7) of the HMT.

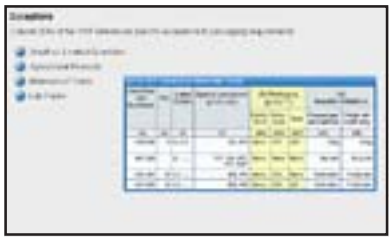
2. "Forbidden" in Column (9A) means the hazardous material(s) cannot be transported or offered for transportation by aircraft or railcars carrying _____.

3. Hazardous materials packaging for air shipments must be designed and constructed to prevent _____ caused by altitude and temperature changes.

4. Package closures must be held securely in place to prevent leakage. Some materials must be packaged with sufficient non-reactive _____ material to absorb any leakage.

5. Cylinders must be protected from valve operation and damage when shipped by air. Equip cylinders with _____ or protective headrings or put cylinders in a box or crate.

46



Column (8A) of the HMT references specific exceptions to packaging requirements. In addition, the HMR provides general exceptions that may apply to small quantities of some classes of hazardous materials. Click on each of the buttons to learn about these exceptions.

47

The criteria for determining "small quantities" and exceptions for small quantities of certain hazardous materials are found in Section 173.4 of the HMR. The term "small quantity" is not synonymous with the term "Limited Quantity". The definition for "Limited Quantity" is found in Section 171.8 of the HMR. These two terms have entirely different meanings and uses; both are excepted from specification packaging.

48

Some small quantities are subject only to 173.4 of the HMR. The notation "This package conforms to 49 CFR 173.4" must be marked on the package. Gross mass must not exceed 64 lbs.

49

Section 173.5 of the HMR contains exceptions for farmers when they transport agricultural products, other than hazardous wastes, between fields of their own farm or to or from their farm. Agricultural products are defined as hazardous materials used to support farming operations, and include but are not limited to fertilizers, pesticides, soil amendments and fuel. Agricultural products are limited to materials in Classes 3, 8, 9, Divisions 2.1, 2.2, 5.1, 6.1, and ORM-Ds.

50

Farmers transporting agricultural products other than gases between fields of the same farm using local roads are excepted from the requirements in the HMR. The farmer must be an intrastate private motor carrier. This exception does not apply to Class 2 gases, such as liquefied petroleum gas or anhydrous ammonia. To use this exception, you must use the agricultural products on your own farm. Each state must authorize these exceptions by law or regulation. You must comply with all state requirements.

51

Farmers transporting agricultural products to or from a farm, within 150 miles of the farm, are excepted from the requirements in Subpart G - Emergency Response Information, and Subpart H - Training, and Specification packaging requirements. They must comply with Subpart C - Shipping Papers, Subpart D – Marking, Subpart E – Labeling, and Subpart F,- Placarding.

52

All requirements and exceptions for Materials of Trade transported by motor vehicle are found in Section 173.6 of the HMR. Materials of Trade is defined as a hazardous material, other than a hazardous waste, that is carried on a motor vehicle for at least one of the three following purposes:

- to protect the health and safety of the motor vehicle operator or passengers;
- to support the operation or maintenance of a motor vehicle or auxiliary equipment; or
- to directly support a principal business that is other than transportation by motor vehicle, in the case of a private motor carrier.

53

To qualify for the Materials of Trade exception, the materials must be less than the quantity limitations outlined in Section 173.6(a). Except for a diluted mixture of Class 9 material, the aggregate gross weight of all Materials of Trade on a motor vehicle may not exceed 200 kg.

54

Each material must be packaged in the manufacturer's original packaging or a packaging of equal or greater strength. The packaging must be leak tight for liquids and gases, sift proof for solids, and securely closed, secured against movement, and protected against damage. Outer packagings are not required for receptacles that are secured in cages, bins, boxes or compartments. Gasoline must be in DOT authorized or OSHA approved metal or plastic cans. Cylinders and pressure vessels must conform to the HMR except that outer packagings are not required.

55

You must inform the vehicle operator of the presence of the hazardous materials, including the reportable quantity, if applicable, and the requirements contained in Section 173.6., when transporting materials of trade.

56

Waste materials classed in specific Hazard Classes or Divisions are excepted from the HMR specification packaging requirements for combination packages, also called lab packs, if:

- packaged in certain types of combination packagings in accordance with Section 173.12(b);
- transported for disposal or recovery; and
- transported by highway only.

57

For lab packs, the outer packaging must be a UN1A2 or UN1B2 metal drum, UN1D plywood drum, UN1G fiber drum, or UN1H2 plastic drum tested and marked at least for Packing Group III materials. Gross weight may not exceed 205 kg. Any lab pack drum must be tested and marked as authorized at least for Packing Group III materials. The outer packaging may contain only one hazard class.

58

Inner packagings of glass must not be over 4 liters capacity; inner packagings of metal or plastic must not be over 20 liters capacity. Inner packagings of liquids must be surrounded by enough compatible absorbent material to absorb all of the liquid content.

59

Materials not authorized for lab packs include materials that meet the definition of Division 6.1, Packing Group I, or Division 4.2, Packing Group I.

60

Professor Fed's Knowledge Check 12

Instructions: Select the correct answer from the choices provided.

What is the maximum capacity for a glass inner packaging, inside a lab pack?

A. not over 8 liters
B. not over 6 liters
C. not over 4 liters
D. not over 2 liters

61

You may place damaged or leaking packages of hazardous materials and spilled or leaked hazardous materials in a metal or plastic removable head salvage drum. The drum must be compatible with the material. Click on each button to learn more.

62

The salvage drum used must be of a specific type, tested and marked for Packing Group III or higher performance standards; or a "Salvage Drum" manufactured and marked prior to October 1, 1993. The drum capacity must not exceed 450 liters or 119 gallons. When necessary, each salvage drum must contain enough absorbent and cushioning material that is compatible with the hazardous materials, to prevent excessive package movement and absorb all free liquid at the time of closing.

63

Professor Fed's Knowledge Check 13

Instructions: Select the best answer from the four choices provided.

Salvage drums must meet PG III (or higher) performance standards or be a pre-October 1, 1993 "Salvage Drum." Capacity must not exceed _____.

A. 119 kg.
B. 540 L
C. 450 L
D. 238 lbs

64

You must mark the salvage drum with the proper shipping name of the hazardous material inside the packaging, the name and address of the consignee; and the word(s) "Salvage" or "Salvage Drum." You must properly label the drum for the material it contains. The ID No. marking is not required on salvage drums.

65

Professor Fed's Knowledge Check 14

Instructions: Select the correct answer from the choices provided.

What type of marking is NOT required on salvage drums?

A. Proper shipping name
B. ID number
C. Name and address of consignee
D. Words "Salvage" or "Salvage Drum"

66

The shipper of a hazardous material in a salvage drum must prepare shipping papers for the material in accordance with the HMR.

67

Professor Fed's Knowledge Check 15

Instructions: Select the best answer from the four choices provided.

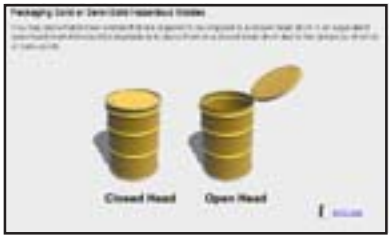
Salvage drums must be marked with the proper shipping name, name and address of the consignee, and the word _____ or Salvage Drum.

A. waste
B. trash
C. recycled
D. salvage

68

When a salvage drum is used to ship a damaged or leaking package, the salvage drum is not subject to HMR overpack requirements.

69



You may place hazardous wastes that are required to be shipped in a closed head drum in an equivalent open head drum - provided the wastes contain solids or semi-solids that would make placement of the wastes in a closed head drum impractical.

70

You must package hazardous materials offered for transportation by, for, or to the U.S. Department of Defense (DOD) in accordance with the HMR, or in DOD-certified packagings of equal or greater strength and efficiency. This rule includes commercial shipments under government contract. Click on each button to learn more about the special requirements for DOD Packaging.

71

Hazardous materials offered by DOD under these provisions may be reshipped by any shipper to any consignee as long as the packaging hasn't been altered or damaged.

72

Hazardous materials sold by DOD in packaging not marked in accordance with the HMR may be shipped from DOD installations; but the DOD must certify in writing that the strength and efficiency of the packaging is equal to or greater than that of the packaging required by the HMR.

73

For each shipment, shippers must obtain the certification, in duplicate, from DOD. Shippers must provide the originating carrier with a copy and retain the other copy for at least one year.

74

Special permits are waivers from specific requirements of the HMR. DOT will only issue a special permit, however, when you show you can provide a level of safety and public protection equal to that provided by compliance with the portion of the HMR from which you seek the waiver. Special permits are usually specific as to the hazardous material, the hazard class, the regulations affected, and any special safety provisions necessary. Special permits that are granted are assigned their own individual number, for example, DOT-SP 8308. Unless exempted by provisions of the special permit, the number must be marked on the package and on the shipping paper in association with the shipping description for the material. Other sections which address the use of special permits are located in 172.203(a), 172.301(c), 172.302(c), and 173.22a.

75

You may offer authorized packages of hazardous materials for transportation packed in an overpack. Packages may not contain prohibited material and must meet standard packaging requirements. Overpacks are not packages. Overpacks are used to consolidate packages that could, under normal conditions, be offered and transported individually. Click on the buttons to learn more.

76

You must mark an overpack with the proper shipping name and ID Number of each material contained, and label it for each material contained. If all relevant inner package markings and labels are visible, however, overpack marking and labeling may be omitted.

77

The overpack is marked with the word “OVERPACK” when specification packagings are required, unless specification markings on the inside packages are visible. If the packages inside the overpack are required to be packed with closures upward, the overpack must be marked with orientation arrows (pointing in the upward direction) on two opposite vertical sides of the overpack.

78

You may not overpack packages containing Class 8 (corrosive) materials, PG I, or Division 5.1 (oxidizing) materials, PG I, with any other hazardous materials.

79

You may transport hazardous materials required to be labeled “POISON” or “TOXIC” in the same vehicle with foodstuffs, feed, or any edible material intended for human or animal consumption, if the hazardous material has been marked, labeled, packaged, and overpacked in accordance with the HMR. These requirements are found in Section 173.25(c).

80

When offered in accordance with Section 173.28, certain packagings may be used more than once to transport hazardous materials. Some non-bulk packaging used more than once must be retested and/or reconditioned as required by Section 173.28(b)-(d). You may review the reuse provisions for specific types of packages in Section 173.28.

81

If a packaging has been emptied, but not cleaned and purged, and contains only residue, you may not offer it for transportation – unless you offer it in the same manner as before being emptied. This includes proper closure of all openings and valves. The conditions and exceptions associated with this requirement are found in Section 173.29.

82

You must not offer or transport hazardous materials in certain packages or under certain conditions. Section 173.21 lists those prohibitions.

83

The person offering a hazardous material for transportation must assure that the packagings are compatible with the lading. Plastic packaging must not be permeable to an extent that a hazardous condition is likely to occur during transportation. Parts 178, 179, and 180 provide standards for the manufacture, testing and certification of packagings.

84

Professor Fed's Knowledge Check 16

Instructions: Click and drag each of the terms shown here to fill in the blanks below. Click on the DONE button when you are finished.

foodstuffs	special permit	registered	certified	letter
vapors	placarded	labeled	grain	HMT
HMR				

1. Hazardous materials offered by, for, or to the DOD must be packaged as required by the HMR or in packaging _____ by the DOD. DOD packages may be reshipped by any shipper to any consignee if unaltered and undamaged.

2. A hazardous material may be transported in accordance with the procedures specified in a DOT _____, which has been issued by the USDOT headquarters in Washington, D.C.

3. Authorized packages of hazardous materials may be consolidated into overpacks. Overpacks must be properly marked and _____for the materials inside.

4. POISON-labeled or TOXIC-labeled materials, properly overpacked, may be transported in the same motor vehicle with _____ and animal feed.

5. Containers may be reused provided they comply with the _____.

85

This concludes the instruction and Knowledge Checks for Module 5 – Packaging. You should now be able to:

- Define “package” according to the HMR
- Identify the shipper’s responsibility as it relates to hazardous materials packages, and any exceptions to these requirements
- Identify special types of packaging required for a variety of hazardous materials, including general and specific requirements and any exceptions
- Identify requirements and exceptions related to Limited Quantities, Agriculture Products, Materials of Trade, and Lab Packs
- Identify required methods for handling damaged or leaking HM packages
- Identify DOD packaging certification requirements
- Identify overpack packaging requirements.

It is now time to assess how well you understand the information presented in this module. When you are ready, select Test on the Express Lane, to begin the end of module test for Module 5. This will be an open reference test. Good luck.

End of Module Test

Now that you have completed reviewing the topic on Packaging, let's evaluate how well you have mastered this material. This end of module test contains nineteen multiple-choice questions to determine your mastery of the seven learning objectives covering Packaging. This is an open reference book test and you may use any of the references that you have to assist you in successfully completing this test.

Instructions: Select the best answer from the four choices provided.

Question #1

A shipment of hazardous materials that is not prepared in accordance with the HMR may be offered for transportation by which mode?

A. Cargo aircraft
B. Containerized rail
C. Containerized sea
D. It may not be moved via any mode.

Question #2

Hazardous materials packagings may be used more than once:

A. Only when they were previously used only for non-hazardous shipments
B. Only if they are inspected and if necessary reconditioned and comply with the HMR
C. Only in the case of a limited quantity and the packaging complies with the HMR
D. Only in the case of a DOD shipment

Question #3

Which of the following qualifications is necessary for a hazardous material to be offered for transportation in an HMR approved container?

A. Proper classification
B. Proper description
C. Proper markings on the package
D. All of the above

Question #4

An overpack containing four one-liter metal cans of Compound, cleaning liquid, a Class 3 (Flammable liquid), PG I, being offered for transportation by aircraft, does not require _____.

A. label(s)
B. marking
C. specification packaging
D. any of the above

Question #5

A waste Class 3 material (Flammable liquid) is NOT subject to the specification packaging requirements of the HMR if packaged in _____.

A. an open-head drum
B. a steel or aluminum drum
C. a lab pack, offered for air transportation
D. a lab pack, offered for highway transportation

Question #6

The responsibility for properly preparing a hazardous material package for transportation falls on: _____.

A. The carrier
B. Both the carrier and the shipper (offeror)
C. The shipper (offeror)
D. The public

Question #7

Which would be an acceptable way to pack Compound, cleaning liquid, a Class 3 (Flammable liquid), PG II, to offer it as a Limited Quantity (Ltd. Qty.)?

A. One 5.0 liter glass container
B. Two two-liter metal cans, packed in a strong outside container
C. Four one-liter metal cans, packed in a strong outside container
D. Both B and C above

Question #8

What must the DOD provide for hazardous materials sold by DOD in packaging not marked in accordance with the HMR may be shipped from DOD installations?

A. Certification that the strength of the packaging is double that of the packaging required by the HMR.
B. Plenty of absorbent material surrounding the hazardous materials.
C. Written certification of the strength and efficiency of the packaging are equal to or greater than the packaging required by the HMR.
D. Include bar code tags containing an electronic MSDS with the load.

Question #9

Acetone, Class 3 (Flammable liquid), with a flash point of –9.4°C (15°F), may be packaged and offered for transportation in: _____.

A. An earthenware receptacle without an outer packaging
B. A UN 1A1 steel drum, with or without an inner packaging
C. A metal receptacle without an outer packaging
D. A UN 1A1 steel drum, only in combination with an acceptable inner packaging

Question #10

Which of the following does NOT accurately describe a carrier of hazardous material?

A. A carrier may repackage hazardous material
B. A carrier may function as a shipper
C. A carrier MUST comply with the HMR
D. A carrier initially packages and prepares the hazardous material for shipment.

Question #11

If a carrier repackages a hazardous material for any reason, the packaging must be _____.

A. approved by the shipper
B. repackaged in accordance with the HMR
C. inspected by DOT prior to the offering of the packaging
D. None of the above

Question #12

What two terms describe quantities that are excepted from specification packaging?

A. Small Quantities and Limited Quantities
B. Minute Quantities and Small Quantities
C. Limited Quantities and Bulk Quantities
D. Bulk Quantities and Small Quantities

Question #13

When filling a packaging or receptacle for liquids, the shipper must: _____.

A. first verify its capacity by filling it with a granular solid, such as sand
B. mix the liquid with an inert component
C. allow enough empty space for expansion caused by temperatures likely to be encountered in transportation
D. allow enough empty space for complete conversion of the liquid to a gaseous state

Question #14

For waste hazardous materials packaged in a "lab pack", the inside packaging must be: _____.

A. glass not exceeding 4L (one gal.) rated capacity
B. metal not exceeding 40 L (10 gal.) rated capacity
C. metal or plastic not exceeding 20 L (five gal.) rated capacity
D. either a or c

Question #15

Overpacks must be marked with all of the following EXCEPT:

A. The proper shipping name
B. The ID number
C. The weight in both English and metric units
D. A label for each material it contains

Question #16

Which is true of a hazardous material required to be labeled "POISON" or "TOXIC"?

A. It may never be transported in the same vehicle with foodstuffs or animal feed
B. It may be transported in the same vehicle with animal feed, but not foodstuffs for human consumption, if it has been marked, labeled, packaged, and overpacked in accordance with the HMR.
C. It may be transported in the same vehicle with foodstuffs or animal feed, if it has been marked, labeled, packaged, and overpacked in accordance with the HMR.
D. The shipper must use his own vehicle (not a commercial carrier) to transport these materials.

Question #17

Which column of the HMT lists the section in the HMR which provides packaging exceptions for a given hazardous material?

A. 8B
B. 8A
C. 8D
D. 7A

Question #18

Where would you find information on packaging a non-bulk shipment of Nitric Acid, less than 70%?

A. 173.227
B. 173.242
C. 173.158
D. 173.243

Question #19

A container filled with a hazardous material is called a: _____.

A. packaging
B. package
C. combination packaging
D. hazardous substance